

ART. XIX.—*On the Earthquake Wave of the 15th August, 1868.*

[Read by the President, R. L. J. ELLERY, Esq., 29th October, 1868.]

The President gave a brief account of the unusual waves which were experienced on the shores of some of the Pacific islands, New Zealand, and Australia, on the 15th of August last, which he stated were undoubtedly the result of the frightful earthquakes which occurred along the west coast of South America on the 13th August. He had obtained the local times of the occurrence of the waves at Apia, or Charlotte Island, of Gilbert's Group in the North Pacific; at Lyttleton, New Zealand; at Sydney, Adelaide, and King George's Sound. The waves had been experienced at many other places, but he had not got the times with sufficient precision to make any use of them to obtain the rate at which the sea disturbances must have travelled. The waves at King George's Sound—the most westerly point at which they were noted—were weak but "notable." At Adelaide they were unmistakably remarked at 7 a.m., 10 a.m., and again at 4 p.m. At Sydney the tide gauge showed the first disturbance at 2.30 a.m. on the 15th, but the greatest effect took place five hours later. At Newcastle 7.24 a.m. it swung the ships at anchor around, and washed boats on shore. In New Zealand and Chatham Islands the wave rose from four to eight feet, doing considerable damage on the low-lying coasts. In Savaii, in the Navigators Islands, it rose fifteen feet on the east side, while at Apia much further north and east, it rose as high as eight feet.

From intelligence last received from Callao, it appeared that climax of the earthquake took place there at about 5.15 p.m. local time, although further south it did not happen till 9 p.m. Assuming the time at Callao, therefore, as 5.15 p.m. on the 13th, the corresponding Greenwich time would be about 10.19 p.m. on the 13th. The times of occurrence of the waves at the various points, as well as their approximate distances from Callao, were given as follows:—

Locality.	Greenwich Time of Occurrence.			Time Occupied by Transit.	Approx. Distance from Callao. Naut. Miles.	Rate of Transit. Miles per Hour.
	D.	H.	M.			
Apia, N. Pacific	14	2	28	15.48	6590	417
Lyttleton, N.Z.	14	4	20	17.36	5720	327
Sydney	14	6	10	17.30	6907	394
Adelaide	14	11	40	25.00	7383	295
King George's Sound ...	14	12	28	25.30	7846	308

He pointed out that there appeared to be a retardation of the wave as the distance from the centre of disturbance increased; and that the late hour at which it was felt at Adelaide would be accounted for by the position of that place with respect to the southern coast line of Australia. It was also suggested that the apparent retardation might be the result of assuming the centre of disturbance too far east from the Australian coast: at Callao, for instance, whilst it might really have been in the Pacific a long way to the west of that place. If such were the case it would make the rates of the wave transit much more equable. The average rate of transit, omitting Adelaide, was 381 miles per hour; in the great earthquake at Simoda in Japan in 1854, the rate of transit, from observations made at San Francisco, was 370 miles per hour.*

ART. XX.—*Notes on the Secondary Beds of Northern Australia.* By H. A. THOMPSON, Esq.

[Read by Mr. Rawlings, 9th November, 1868.]

Some time ago a considerable degree of interest was taken in the papers read by Professor M'Coy, bringing under the notice of the Royal Society the existence of secondary rocks on this continent, as indicated by the fossil bones of the ichthyosaurus and pleisiosaurus, and cretaceous shells discovered on the Flinders River, near the Gulf of Carpentaria.

Having lately crossed the country where these organic remains were found, it may be of some interest to communicate the few observations that were made in the course of a rapid journey from Cleveland Bay on the east coast to the

* Mallet's Report on Earthquakes. Brit. Assoc. Report, 1858, page 126.